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A comparison of the Academic Learning Time-Physical Education of high-skilled and low-skilled female intercollegiate volleyball players

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A COMPARISON OF THE ACADEMIC LEARNING TIME-PHYSICAL EDUCATION OF HIGH-, AVERAGE-, AND LOW-SKILLED FEMALE INTERCOLLEGIATE VOLLEYBALL PLAYERS

by

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An Abstract

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ABSTRACT

This study was conducted to compare the academic learning time-physical education (ALT-PE) of high-, average-, and low-skilled female intercollegiate volleyball players. Twelve female volleyball players, at the same college in central New York, served as subjects. The head coach, a female, was asked to rank her players from high to low according to overall playing ability. The top 4 players were classified as high-skilled, the middle 4 as average-skilled, and the remaining 4 as low-skilled. The coach wore a wireless microphone and was videotaped along with her team 18 times during the 1981 season. The videotapes were coded using the revised ALT-PE instrument (Siedentop, Tousignant, & Parker, 1982). During the coding of each practice session, three target players were selected to represent each skill group. The target players were observed for an entire practice session on an alternating interval basis. Data obtained from these codings were compiled into percentages for each ALT-PE category. Visual inspection of the data revealed little difference in the context level of high-, average-, and low-skilled female intercollegiate volleyball players. However, several differences between the high-, average-, and low-skilled players appeared at the learner involvement level. High-skilled players were motor engaged more, accrued more ALT-PE, spent less time inappropriately engaged, and waited much less than their average- and low-skilled teammates.

The differences in accrued ALT-PE of high-, average-, and low-skilled players led to the rejection of the hypothesis that stated there would be no significant differences in the amount of ALT-PE accrued by high-, average-, and low-skilled female intercollegiate volleyball players. The coach in this investigation treated her athletes differently, based on their skill level. High-skilled players were given more opportunities to improve their skills and achieved more during practices, as indicated by their accrued ALT-PE, then lesser skilled teammates.

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A Thesis Presented to the Faculty of
the Division of Health, Physical
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Division of Health, Physical Education, and Recreation

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CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science Thesis of

KRISTINE E. TERRILLION

submitted in partial fulfillment of the requirements for the degree of Master of Science in the Division of Health, Physical Education, and Recreation at Ithaca College has been approved.

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DEDICATION

This thesis is dedicated to Jeanne, whose friendship, belief in me, strength, and support enabled me to achieve this personal goal.

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Chapter 1

INTRODUCTION

Coaches have always looked for methods to improve coaching techniques and, therefore, their effectiveness. There is much material available to a coach regarding the substance of practice (drills, etc.). However, coaching effectiveness is a result not only of practice design, but of the behaviors that a coach elicits and the way each athlete spends her or his practice time. In order to develop and perform at their optimum level, athletes must have opportunities in practice to fully develop their skills.

Dr. Taras Liskevych (1977), the 1988 women's U. S. Olympic volleyball coach, stated that the crucial factor of any practice session is how many meaningful contacts each player has on the ball and how much time is spent in active learning. Liskevych stated that active learning includes a player contacting the ball, going through movement or form drills (individual or team), physical conditioning, warm-up and warm-down, and actual playing in scrimmage situations. He also stated that active learning does not include managerial time (explaining drills, giving directions) and non-active learning (coach lecturing, instructions, demonstrations, waiting in line, ball shagging, or rest). Liskevych indicated that coaches should have the active learning of individual athletes timed so that athletes would spend a minimum of 65% of the practicing time in active

learning.

One means available to assess the amount of time-on-task of athletes during practice is a systematic observation instrument called Academic Learning Time-Physical Education (ALT-PE) developed by Siedentop, Birdwell, and Metzler (1979). The ALT-PE instrument is used as an indicator of teacher effectiveness, student involvement in class situations, and an ongoing measure of time-on-task. Because the instrument focuses on individual student behavior, the amount of time a student spends successfully engaged in relevant motor tasks can be determined (Siedentop et al. 1979). Siedentop et al. found that ALT-PE could be used to reliably determine student learning and teacher effectiveness.

Several researchers (Galli, 1982; Hecklinger, 1985; Shaffner, 1986; Shields, 1984; Thomas, 1983) have used the ALT-PE instrument in the coaching environment to analyze the amount of time athletes spend in practice. The difference in practice opportunities afforded athletes of different skill abilities was examined by these researchers. These researchers indicated that the amount of ALT-PE accrued by athletes of different abilities is not the same. Generally, research indicated that athletes of high-skill ability accrue more ALT-PE than their lesser skilled teammates.

Because the ALT-PE instrument examines the actions of individual athletes, it can also be used to evaluate the pygmalion effect. Behaviors of a coach toward athletes of

different abilities often reflect the expectations that the coach has of the particular athlete. Recent studies using the ALT-PE instrument in the athletic environment indicated that coaches do exhibit different behaviors toward their athletes of different skill abilities. These studies revealed that the pygmalion effect is present in the athletic environment (Mancini & Wuest, 1987).

To add to this research, the revised version of the ALT-PE instrument (Siedentop, Tousignant, & Parker, 1982) was used to compare the activities of high-, average-, and low-skilled intercollegiate female volleyball players and to examine the behavior the coach exhibits toward athletes of different abilities.

Scope of Problem

The ALT-PE of high-, average-, and low-skilled female intercollegiate volleyball players were investigated. Twelve female volleyball players at a central New York, NCAA Division III college served as subjects. Eighteen practice sessions during the 1981 season were videotaped. Following the season, the coach ranked her players on a continuum from high to low according to overall playing ability. For this study the top 4 players were classified as high-skilled, the next 4 players average-skilled, and the remaining 4 players low-skilled. During each practice, three target players were selected to represent each group: high-skilled players, average-skilled players, and low-skilled players. The target players were observed for

an entire practice session on an alternating interval basis using the revised ALT-PE observational system (Siedentop et al., 1982).

Statement of Problem

The purpose of this study was to investigate the differences, if any, in the amount of ALT-PE experienced by high-, average-, and low-skilled female intercollegiate varsity volleyball players.

Null Hypothesis

There will be no significant differences in the amount of ALT-PE accrued by high-, average-, and low-skilled female intercollegiate volleyball players.

Assumptions of Study

The following assumptions were made for the purpose of this study:

1. The coding of 18 practice sessions of the team would be sufficient to yield valid data on the athletes' behaviors.

2. The target players that were chosen as subjects were representative of their ability group.

3. The revised ALT-PE instrument provided a valid and accurate view of the athletes' involvement in the team setting.

Definition of Terms

The following terms were operationally defined for the purpose of this study:

1. Allocated time is the amount of time designated by

the instructor (coach) for a learning task (Siedentop et al., 1979).

2. Engaged time is the percentage of allocated time the student (athlete) was actively responding (Siedentop et al., 1979).

3. Academic learning time (ALT) is the amount of time a student (athlete) spends engaged in a relevant learning task with a high success (Marliave, Fisher, & Dishaw, 1972).

4. Academic learning time-physical education (ALT-PE) is the amount of time a student (athlete) spends engaged in physical education tasks at the easy level of difficulty (Siedentop et al., 1979).

5. Coach is the individual who directed and was primarily responsible for the women's volleyball team at the central New York college in this investigation.

6. Low-skilled athlete is a player whose skill ability, as determined by her coach, ranked her in the bottom 33% of the team.

7. Average-skilled athlete is a player whose skill ability, as determined by her coach, ranked her in the middle 33% of the team.

8. High-skilled athlete is a player whose skill ability, as determined by her coach, ranked her in the top 33% of the team.

Delimitations of Study

The following were the delimitations of this study:

1. One female intercollegiate volleyball coach from the central New York area was used in this study.

2. Twelve female intercollegiate volleyball players, 4 high-, 4 average-, and 4 low-skilled, from the central New York area were used in this study.

3. The subjects were videotaped for 18 entire practice sessions.

4. ALT-PE was the only instrument used to record the group context level and the learner involvement level during the practice session.

Limitations of Study

The following were the limitations of this study:

1. Since only one college was used, the findings may only be valid for female volleyball players and their coach at the involved college.

2. The findings related to the context and learner involvement levels may be valid for comparison only when the ALT-PE instrument is used to identify involvement.

Chapter 2

REVIEW OF RELATED LITERATURE

This study compared the differences in the amount of academic learning time-physical education (ALT-PE) accrued by female intercollegiate volleyball players of high-, average-, and low-skilled ability. The review of literature relevant to this investigation will focus on the following areas: (a) the systematic observation of coaches and their athletes, (b) the development of ALT-PE, (c) research using ALT-PE in physical education, (d) research using ALT-PE to examine the pygmalion effect in coaching, and (e) summary.

Systematic Observation of Coaches and Their Athletes

Prior to the mid-1970's, analysis of coaches and their athletes was performed primarily by focusing on coaches' personalities, traits, and behaviors through the use of psychological inventories or questionnaires. Teaching behaviors, however, were researched by systematically observing and coding teachers' behaviors. Gradually, the use of systematic observation techniques to analyze coaches' behaviors was accepted and began to be utilized in research (Darst, Mancini, & Zakrajsek, 1983).

Kasson (1975) was the first researcher to quantitatively analyze coaches' behaviors through direct observation. The Mancuso Adaptation for Verbal and Nonverbal Behavior (Mancuso, 1973) was used to analyze the behaviors of three male physical educators who taught and coached at the university level. Results indicated that

physical educators were as direct in their coaching as they were in their teaching. Further results indicated that nonverbal behavior was more common in teaching, while verbal behavior was more common in coaching.

Tharp and Gallimore (1976) reported data on the coaching behaviors of UCLA basketball coach, John Wooden, using their own 10-category observational system. The investigators found that over 50% of the coaching behaviors were instructionally oriented. Results also showed that individual praises and scolds were almost equal in number but that the amount varied from player to player.

Langsdorf (1980), through objective observation, analyzed the coaching behavior of a very successful major university football coach. Langsdorf reported that the most common behaviors exhibited were hustle and scold/reinstruction. He also reported that the amount of praise was equal to the amount of scolding and that most scolding was followed by instruction. When Langsdorf compared his data to that of Tharp and Gallimore (1976), he found significant similarities in the behaviors of the two coaches.

Another systematic assessment system, Coaching Behavior Assessment System (CBAS), was developed by Smith, Smoll, and Hunt (1977). The CBAS classified coaches' behaviors into two categories: reactive behaviors (responses to immediately preceding player or team behaviors) and spontaneous behaviors (initiated by the coach not

immediately preceding events). The investigators concluded that the CBAS was more effective in sports such as volleyball and baseball because these sports involve relatively discrete events. In sports in which the action was continuous (basketball and soccer), the investigators had difficulty in ascertaining to which activities the coach was responding.

Another study used the CBAS system along with a preseason and postseason assessment of coaches' expectations concerning players' abilities (Horn, 1983). Horn (1983) studied the relationship between coaches' perceptions of players' ability and their behavior toward female softball players at the junior high level. Results indicated that coaches do show differential patterns of behavior toward athletes based on their perceptions concerning players' abilities. Horn suggested that the differential patterns of behavior reflected the coaches' attempts to individualize instruction rather than to favor behavior toward high ability athletes.

A study to determine the effects of intervention on athletes' behavior was conducted by Crossman (1980) using the Ohio State Athletic Observation Code (OSAOC). Athletes in three sports (wrestling, gymnastics, and volleyball) were supplied with feedback after practice sessions had been coded. Crossman indicated that this intervention was effective in producing more positive practice behavior in wrestlers and gymnasts, but not in volleyball players.

Darst, Langsdorf, Richardson, and Krahenbuhl (1981) used an objective recording technique to describe how football players used their time in practice. The observations of the athletes were then used as an indicator of effective coaching and practice organization. The researchers found that the athletes spent large amounts of time in the waiting category, which was classified as unproductive practice time. The most productive segments of practice were warm-up and agility. The researchers concluded that coaches should be aware of the productive-unproductive segments of practices.

Coaching behavior has also been analyzed by researchers (Agnew, 1977; Avery, 1978; Barr, 1978; Hirsch, 1978; Proulx, 1979; Rotsko, 1979; Staurowsky, 1979; Stulmaker, 1981) through the use of the Cheffers' Adaptation of Flanders' Interaction Analysis System (CAFIAS) (Cheffers, 1972). Agnew (1977) investigated differences in behavioral patterns of female secondary physical education instructors when teaching and coaching. Results indicated that interaction was more evident in the coaching setting. There was also more praise and acceptance, use of questioning, and athlete-initiated behavior in the coaching setting. Agnew reported that the interaction exhibited between coach and athlete was more flexible than the interaction that occurred between the teachers and students.

Barr (1978) studied the effects of CAFIAS as an intervention technique with team sport coaches on the

secondary level. Coaches who received instruction and feedback using CAFIAS were found to use more acceptance and praise and more questioning. Barr also reported an increase in athlete-initiated behavior.

Stulmaker (1981) used CAFIAS to compare the coaching behaviors of female and male secondary basketball coaches. There were no significant differences reported in the coaching behaviors of the two groups. Results indicated that the behavior patterns exhibited most often for both males and females were extended information-giving, coaches' directions followed by athletes' predictable response, athletes' predictable response followed by coaches' information, and extended athletes' scrimmage or interpretive drills.

A few researchers have combined the use of CAFIAS with other observational instruments to further investigate coaching behavior. Avery (1978) and Rotsko (1979) used the Coaches' Performance Criteria Questionnaire (CPCQ) (Rosenshine & Furst, 1973) along with CAFIAS to examine behaviors of effective and less effective coaches. Results of both studies indicated that effective coaches used more indirect behavior and more verbal and nonverbal praise than ineffective coaches.

The Group Environment Scale (GES) (Moos, Insel, & Humphrey, 1974) was used by Hirsch (1978), Proulx (1979), and Staurowsky (1979) along with CAFIAS to compare behaviors of coaches in different athletic environments. In these

studies, athletic teams were categorized into groups that were either satisfied or not satisfied with their social climate. Results in all three studies indicated that there were greater coach-athlete interactions and more athlete-initiated behaviors in satisfied environments. The studies also showed that coaches in satisfied environments used more acceptance and praise and provided more organization.

The behaviors of secondary school coaches trained to teach physical education and coaches trained to teach other academic subjects were compared in a project undertaken by Kenyon (1981). Using CAFIAS to describe the behaviors, Kenyon determined that the two groups of coaches were significantly different on several of the CAFIAS variables. Kenyon determined that coaches trained as physical educators used more praise, acceptance, questions, direction-giving, and criticism than the classroom teacher/coach. The classroom teacher/coach did provide more information-giving during practices. The athletes of the physical educators spent more time scrimmaging in practices, while athletes of the classroom teachers spent more time in predictable drilling.

CAFIAS was used by Sciera (1983) to study the behavior of football coaches during preseason, after wins, and after losses. Sciera reported the following results: coaches used more acceptance, praise, and information-giving during preseason; coaches used less acceptance and praise after

wins; and after losses there was a significant increase in the use of criticism. After wins, athletes exhibited more interpretive than predictable behaviors. After losses, predictive and interpretive behaviors were evenly distributed.

Several studies have used the Dyadic Adaptation of CAFIAS (DAC) (Martinek & Mancini, 1979) to investigate the behaviors of coaches and how they interact with athletes of different abilities (Boyes, 1981; Hoffman, 1981; Ware, 1985). Boyes (1981) investigated the interaction behaviors of football coaches with their starting and non-starting players. Results indicated minor differences in the interaction behaviors of coaches and the starting and non-starting players. Boyes indicated that coaches displayed more praise, acceptance of ideas and actions, and interpretive and self-initiated responses toward starters, while non-starters received more directions and exhibited very predictable responses.

DAC was used by Hoffman (1981) to investigate the behavior of two collegiate lacrosse coaches, a male and a female, with their high- and low-skilled athletes. Hoffman reported that both coaches gave more acceptance and praise to the high-skilled athletes. The male coach asked more questions, gave more directions, and gave more criticism to the low-skilled athletes than he did to the high-skilled group. The female coach issued more directions and information to the low-skilled athletes but was more

supportive of the low-skilled group than the male coach. Athlete behavior was similar for both coaches; high-skilled athletes showed more self-initiated behavior, while low-skilled athletes were more predictable in their responses.

Liskevych (1977), in discussing development of practice sessions in the United States Volleyball Association Level I Technical Module, stated that a major concern of coaches should be the production of changes in behavior of athletes. He stated that in order to achieve desired terminal behaviors (performance of athletes during the actual match), the expected behaviors should be reinforced in practices that are part of a carefully planned program. One way to determine if a coach is making a change in the athletes' expected behavior is to analyze the behavior a coach elicits towards the athletes. Accordingly, Ware (1985) utilized DAC to investigate the interaction behaviors of a female head volleyball coach with her high-, average-, and low-skilled athletes. Ware reported the following results:

1. High-skilled athletes received more acceptance and praise, were asked more questions, received more attention, and exhibited more athlete-initiated responses than the average- or low-skilled athletes.

2. Average- and low-skilled athletes received more directions and exhibited more predictable behavior than the high-skilled athletes.

3. Average-skilled athletes received more directions

than the other two groups.

4. The most frequent interaction pattern that the low-skilled athletes received was small amounts of criticism.

Development of ALT-PE

In the early 1970s, a research project called the Beginning Teacher Evaluation Studies (BTES) was undertaken by the California Commission for Teacher Licensing and Preparation. The purpose of this project was to identify teaching behaviors and classroom activities that prompted student academic achievement (Fisher, Berliner, Filby, Marliave, Cahen, Dishaw, & Moore, 1978). The project was carried out in three phases by the Far West Laboratory for Education Research and Development in San Francisco. The BTES project focused on reading and mathematics classes in the second and fifth grades. Phase I, 1972-1973, was the planning phase. During phase II, 1973-74, the development of an instrument and hypothesis for research study took place. Phase III, 1974-78, incorporated the use of the instrumentation developed earlier in a series of field studies.

From the BTES project, a model of classroom instruction evolved and the concept of academic learning time (ALT) was conceived as a teaching process variable to describe student learning (Fisher, Berliner, Filby, Marliave, Cahen, & Dishaw, 1980). Because time was determined to be the most important variable in the learning process, the BTES

researchers designed the ALT model with time as the central component to be studied. This study of time and its relationship to the learning process was further developed as the use of time-on-task for product measures of actual achievement (Berliner, 1979). ALT was therefore conceived as an ongoing observable measure of student learning (Fisher et al., 1978). ALT is specifically defined as "time spent by a student engaged in a task on which few errors are made and where the task is directly related to an academic outcome" (Borg, 1980, p. 41).

Within the ALT model are two time variables: allocated time and engaged time. Allocated time is the time a teacher designates for a particular learning task to occur. Engaged time is the specific part of allocated time in which the student is actually involved in the learning task. Student success rate is also incorporated within the ALT model. The success rate is broken down into three levels to reflect the degree to which the student comprehends the learning task. High success indicates a student easily comprehends the learning task and responds making few errors. Medium success indicates partial understanding of the task with the student making correct responses as well as errors due to lack of understanding. Low success indicates that a student has little comprehension of the task and responds making many errors. Task relevancy is also included as a component within the ALT model. If an activity in a learning task contributes to an academic goal, then that task is highly

relevant to the learning process (Fisher et al., 1980).

The ALT model was determined to have a major advantage in the study of teacher effectiveness, the learning process, and student achievement because the components are concrete and quantifiable (Borg, 1980). The BTES project produced 14 major findings which revolved around ALT, student achievement, and the relationship of the instruction process and classroom environment to student learning (Fisher et al., 1980). A major finding was that increases in ALT were associated with increases in student achievement. When breaking down the ALT model into its basic components for examination, the investigators of the BTES project reported that allocated time was positively associated with academic achievement, and the proportion of time relevant tasks were performed with high success was positively associated with students' learning (Fisher et al., 1980).

The BTES team studied ALT as a measure of student learning through its correlation with student achievement (Fisher et al., 1978). As a result of the BTES research showing ALT to be an important predictor of student learning, the time-on-task approach of the ALT model has undergone further study and development in the area of physical education.

The concept of using ALT as a process approach to measure teaching effectiveness in a physical education setting was first investigated by Siedentop, Birdwell, and Metzler (1979). ALT was assumed to be "strongly and

consistently related to achievement in physical education" and, therefore, could be used to determine teacher effectiveness in physical education (Siedentop et al., 1979, p. 25). The ALT concept in physical education is called academic learning time-physical education (ALT-PE). ALT-PE incorporates the ALT variables of allocated time, student engagement rate, success, and task relevancy. ALT-PE is defined as the "amount of ALT accrued by a student while in a physical education class" (Metzler, 1980b, p. 8).

ALT-PE allows for the measure of active practice time allocated to students within a physical education class and the analysis of that practice time for the actual amount of individual engagement in task relevant material. In studying the learning process in physical education, ALT-PE substitutes the process measure of time-on-task from the BTES research for the usual product measure of achievement because achievement in physical education is so difficult to measure reliably (Siedentop et al., 1979).

To attain measures of ALT-PE, a systematic observation instrument was developed. The original ALT-PE observation system involved decisions in the four major categories of setting, content, learner move, and difficulty level (Siedentop et al., 1979). The setting describes the format for instruction within the class. The content level describes the class as being either on a nonacademic focus or a content-oriented physical education focus. This content level is considered the first level of ALT-PE and is

comparable to allocated time. The learner move level describes the involvement of the individual within the physical education content. This particular level reflects the learner as being either directly engaged in the specific activity or not engaged and is the second level of ALT-PE. The difficulty level requires a judgement to be made as to whether the individual is engaged in an activity at either a high, medium, or low level of success. In order for a unit of ALT-PE to occur, a student would have to be engaged in physical education content at a low error rate (Siedentop et al., 1979). Within these major categories there are several subcategories requiring further decisions: six within the setting content, five within general content, seven within physical education content, six within engaged and nonengaged learner moves, and three within the difficulty level of the learner involvement.

To further refine the investigation of time-on-task, teacher effectiveness, and the relation these have to achievement in a physical education setting, a second more specific ALT-PE variable was conceptualized. This second variable, ALT-PE Motor [ALT-PE(M)] is defined as any interval in which a student is observed in Content-PE activity, engaged in a motor response, and performing that motor response at an easy level of difficulty (Siedentop et al., 1979).

The original ALT-PE behavioral recording instrument was determined to be a reliable instrument for measuring ALT-PE

(Metzler, 1980b). A further investigation into the reliability of the original ALT-PE system was conducted by Godbout (1980). The results from this investigation indicated that the ALT-PE instrument produced highly reliable results in all of the major categories except success rate.

Since the inception of ALT-PE in 1979, much research has been conducted involving the study of ALT-PE using the original instrumentation (Aufderheide, Knowles, & McKenzie, 1980; Birdwell, 1980; Metzler, 1980a; Rate, 1981; Siedentop et al., 1979; Whaley, 1980). Because this research in physical education created a clearer understanding of ALT and its relationship to achievement in physical education, the necessity for a revision in the original system became apparent (Siedentop, Tousignant, & Parker, 1982).

The revised system conceptualizes ALT-PE as a two level, hierarchical decision system. The first level reflects the setting context in which a student's behavior is being observed. The second level reflects the individual student involvement within the context of the class. "Any observation sample in which motor appropriate is chosen for the second level decision becomes one unit of ALT-PE" (Siedentop et al., 1982, p.10).

When making comparisons between the original ALT-PE system (Siedentop et al., 1979) and the revised system (Siedentop et al., 1982), various similarities and differences are apparent. The revised system's divisions of

subject matter knowledge and subject matter motor contain almost identical categories as that of the Content-PE level in the original system. Similarities exist in general content categories in both systems, except that warm-up in the revised system replaces waiting in the original system. The motor engaged category in the revised system is similar to motor engaged categories in the original system. ALT-PE in the revised system (motor appropriate behavior) is similar to ALT-PE(M) in the original system (Content-PE activity, motor engaged, performance at an easy level of difficulty). Most of the other individual categories remain the same.

Research using ALT-PE in Physical Education

The ALT-PE systematic observation instrument has been utilized in a number of studies to examine and describe student learning and teacher behavior in physical education classes at all levels. The first study to investigate ALT-PE in physical education and to provide descriptive data on ALT-PE variables was carried out by Metzler (1980a). Data for this study were collected from observations of 21 teachers and their students, 7 on the elementary level, 7 on the junior high level, and 7 on the senior high level. The teachers were observed in 32 different classes, which were involved in 13 separate physical education activities. From the 32 classes, 91 target students were chosen to be observed and from observations of these students, data on ALT-PE variables were collected and analyzed.

From Metzler's study it was found that the mean percentage of ALT-PE intervals across all observations per class was 26.8%. More specifically, the percentage of ALT-PE in elementary classes was 32.3%, 28.1% in junior high classes, and 20.9% in high school classes. When the ALT-PE percentages were converted into actual time spent during a class, it was found that there were 9.8 min of ALT-PE in elementary classes, 9.4 min in junior high classes, and 7.7 min in senior high classes. The ALT-PE accrued by students while in motor responding tasks only, or ALT-PE(M), was 7.5% across all observations or specifically 9.1% in elementary classes, 8.3% in junior high classes, and 5.0% in high school classes. Students in these classes accrued approximately 2.5 min of ALT-PE(M) per class.

Metzler's study also provided a descriptive analysis of ALT-PE in the various activities that were taught. The highest percentage of ALT-PE occurred in volleyball (59.4%) followed by soccer (40.3%). The lowest percentage of ALT-PE was found in gymnastics (12.3%), football (14.1%), and outdoor pursuits (18.3%). When comparing individual sports versus team sports, it was found that students involved in individual sports accrued more ALT-PE(M). Results also showed that, as the students' skill level increased over class periods, the students did not necessarily perform more tasks at easier levels of difficulty. As the instructional units progressed, students' ALT-PE and ALT-PE(M) did not, for the most part, increase.

Further descriptive data on ALT-PE experienced by elementary and secondary school students were reported in another study (Godbout, Brunelle, & Tousignant, 1983). The data were collected in 30 elementary and 31 secondary physical education classes with each class being observed twice. The investigators reported a significant difference between ALT-PE accrued in elementary classes (31.3%) and ALT-PE accrued in secondary classes (36.5%). These results show more ALT-PE in secondary classes than in elementary classes, while Metzler (1980a) reported opposite findings.

Godbout et al. (1983) also reported that from 19% to 34% of the class period was spent in other than Content-PE activities. When classes observed were involved in Content-PE activities, results showed that students were effectively engaged in those particular activities 50% of the time. Results from this study indicated that the main difference between the elementary and secondary levels was in the amount of Content-PE activities versus General Content activities. At the secondary level, there was less time lost in waiting, managing, and resting, and this time was used to increase competition time. The investigators felt that better management of students' involvement during Content-PE activities would increase student ALT-PE.

In another study which described ALT-PE in a traditional elementary setting only, results indicated that 85% of the time in one teacher's classes was devoted to Content-PE activities (Placek, Silverman, Shute, Dodds, &

Rife, 1982). Within the Content-PE category, more than one third of the students' time was spent in game situations (37%), with most of the rest of the time being spent in scrimmage (31%) and skill practice (12%) situations. All students were reported to have been actively involved in physical education activities 19% to 28% of the time. Students observed in this study were also engaged at an easy level of difficulty from 15% to 24% of the time. The investigators also reported data which indicated that the two teaching styles that predominantly occurred were direct and task instruction.

The data reported by Placek et al. (1982) not only described the general ALT-PE of students as a whole in an elementary setting but also allowed for analysis of girls versus boys and high-, medium-, and low-skilled students. There were no major differences reported between girls and boys. However, a funnel effect was found in the analysis of ALT-PE for the different skill levels. Percentages reported for the skill levels in total engagement showed an increase from low- to medium- to high-skilled students (19% to 21% to 28%, respectively). There were also increases noted in students from low to high skill level in working at a high success rate (15% to 17% to 24%) and in making easy psychomotor responses (8% to 9% to 15%). The investigators indicated that these increases of ALT-PE from low- to high-skilled students supported the "rich get richer" syndrome in physical education (Placek et al., 1982, p. 44).

This syndrome indicates that even though all students are presented with equal opportunities to practice skills, the high-skilled students were more successful in their skill development than low-skilled students.

Other studies have examined ALT-PE in various types of elementary settings (Aufderheide, McKenzie, & Knowles, 1982; Shute, Dodds, Placek, Rife, & Silverman, 1982). In examining differences in ALT-PE between mainstreamed handicapped and regular elementary students, Aufderheide et al. (1982) reported that both handicapped and nonhandicapped students were engaged in similar amounts of learning time in mainstreamed settings. It was found in this study, however, that nonhandicapped students (27.5%) were engaged in motor activities at an easy level of difficulty more than mainstreamed handicapped students (23.1%). The relationship of the use of individualized instruction to the amounts of the ALT-PE accrued by students was also examined. Students, both handicapped and regular, taught using individualized instruction were reported to have spent more time engaged in Content-PE and spent more time engaged in motor activities at an easy level of difficulty.

Shute et al. (1982) examined differences in ALT-PE accrued in a movement education elementary setting between girls and boys; high-, medium-, and low-skilled students; and mainstreamed handicapped and regular students. Percentages reported in the various ALT-PE categories were all similar when comparing accrual of ALT-PE between girls

and boys. In comparing ALT-PE(M) of special needs students and nonspecial needs students, the investigators reported that nonspecial needs students were engaged in motor activities at an easy level of difficulty approximately twice the amount of time of special needs children (13% to 6%, respectively). Differences in ALT-PE(M) were reported between skill groups, with high-skilled students accruing 16%, medium-skilled 11%, and low-skilled students 13%.

One study has examined ALT-PE accrued by children in other than a formal physical education class (McKenzie, 1980). McKenzie (1980) observed young children in beginning swimming classes. The recording format in this study was modified slightly to a 6-s observe/10-s record format. The investigator reported that variability among and within swimmers was evidenced for all ALT-PE categories. Also, results of this study supported the use of posting task achievement as a means for improving learning in this type of situation. The use of time-out from the activity was also explored in this study as a way of discouraging disruptive behavior. Time-out was found to be a useful deterrent but did not necessarily increase the time students spent practicing the activity.

Descriptive studies of ALT-PE accrued by students at the college level have produced varied results (McKenzie, Clark, & McKenzie, 1983; Metzler, 1981a). Metzler (1981a) measured the ALT-PE of college students in eight different activities. Results indicated that ALT-PE occurred in 45%

of all class intervals. These results were almost twice that of the ALT-PE that was accrued by students in grades 1-12, indicated by Metzler (1980a). The college students also accrued nearly twice the amount of ALT-PE(M) (18.5%) as that of the elementary and secondary students.

McKenzie et al. (1983) measured the effect of six different instructional strategies on the ALT-PE of college students in two beginning fencing classes. Of the six teaching strategies, the highest level of ALT-PE(M) was observed in machine-paced drilling and sparring (97.9%), followed by teacher-paced drilling (94.8%), student-paced drilling (90.7%), teaching by task cards (65.9%), and bouting (26.9%). Feedback ranged from a high of 54.8% for student-paced drilling to a low of 18.7% for teacher-paced drilling. McKenzie et al. (1983) suggested that the results indicated that certain strategies were more effective than others in allowing teachers to perform other tasks, such as providing feedback, while maintaining a high rate of engagement.

Several studies have utilized the ALT-PE instrument to examine the effects of different intervention strategies on teachers' behaviors. Birdwell (1980) conducted a study to investigate the effects of instruction and daily feedback on the teaching behaviors of three inservice physical educators and the resulting impact on student ALT-PE. The variables targeted for observation were management time, student non-engagement, and teacher feedback. Results indicated

that, after intervention, management time and student nonengagement decreased and feedback increased. Birdwell found that, as these variables changed, the level of student ALT-PE and ALT-PE(M) increased. As a result of the findings of this study, Birdwell concluded that instructions and daily feedback to teachers were a successful and cost effective method for changing teachers' behaviors and for helping teachers to change students' behaviors.

Whaley (1980) evaluated the effect of daily monitoring and feedback on high school and middle school student ALT-PE. Results of this study indicated that feedback to teachers and students had no effect on ALT-PE or the amount of motor responding by students. Whaley concluded that the changes in ALT-PE occurred with changes in activities rather than as a consequence of the intervention.

A study to determine if ALT-PE(M) in archery could be increased through the use of an intervention strategy was conducted by Metzler (1981b). The intervention strategy was designed to increase the percentage of engaged motor intervals with the intent of increasing ALT-PE(M) by target students in two archery classes. The data indicated that increases in motor engagement occurred immediately after interventions. The intervention strategies of adding extra arrows and allowing two students to shoot at the same target increased time spent in motor engaged categories and, therefore, increased ALT-PE(M).

Beamer (1983) conducted a study to attempt to increase

ALT-PE in a school physical education setting through an inservice education effort with teachers. Nine physical education students and two physical education teachers in two middle schools were observed. The intervention strategies used required the teachers to increase large group monitoring, to get classes into activity more quickly, and to give more feedback to low-skilled students. Results of this study indicated no significant difference observed in ALT-PE of students of different skill levels. Additional teacher feedback to low-skilled students was not effective in increasing their ALT-PE any more than for highly skilled students. ALT-PE was also found to be affected by the nature of the activity, the amount of activity time available, and the efficient use of activity time.

Wurzer (1982) examined the effects of three instructional packages on the behavior of three university professors to determine if there were a subsequent change in student ALT-PE. The professors, who taught volleyball classes, received instructional packages designed to change management time, feedback, and student non-engagement behaviors. Wurzer reported that decreases in teacher management time and student non-engaged time, and increases in feedback to students were associated with a significant increase in student ALT-PE and ALT-PE(M).

The lasting effects of instruction and supervision in interaction analysis (IA) on student ALT-PE was investigated by Grecic (1983). Classes were taught by 26 inservice

physical education instructors during their first 3 years of teaching. Grecic used a control group which received conventional supervisory feedback and a treatment group which received conventional supervisory feedback plus instruction in IA (CAFIAS) during their undergraduate preparation. Results indicated that the control group students spent almost twice as much time on organizational and managerial tasks. Other findings showed that the treatment group students were engaged in motor activity longer and that they were motor engaged more, accruing twice as much ALT-PE as the control group.

Other studies have also been conducted using various forms of feedback as a means of intervention on teaching behaviors. Griffin (1986) compared the effects of conventional supervisory feedback and systematic supervisory feedback obtained through the use of the ALT-PE instrument on the teaching behaviors of preservice teachers. A control group received conventional supervisory feedback, and a treatment group received instruction and supervision in ALT-PE in addition to conventional supervisory feedback. Results indicated that students of teachers in the treatment group accrued more ALT-PE. Systematic supervisory feedback was found to be more beneficial in increasing student ALT-PE than conventional supervisory feedback.

Paese (1982) examined the effect of feedback on ALT-PE(M) of two student teachers at the secondary level. Both verbal and written forms of feedback were used after

the teachers' classes. The teachers were also told how they could decrease management time and increase the motor response of students. Results showed that the use of feedback led to an increase in motor engagement from 18.5% to 43% and an increase of ALT-PE(M) from 7.5% to 19%.

Studies conducted by Young (1981) and Keller (1983) used Experimental Teaching Units (ETU) in their investigations of student ALT-PE and achievement. Young (1981) designed an ETU which consisted of a pre-test, followed by a 20-min lesson, followed by a post-test. Results showed that ALT-PE(M) correlated significantly with achievement. However, further analysis of data suggested that the ETU was not of sufficient difficulty to discriminate adequately between low and high performers. In Keller's study (1983), the effects of two instructional methods on student achievement scores were investigated. Keller also considered which length of instructional period (20, 30, or 40 min) would increase student ALT-PE and the relationship between ALT-PE and student achievement. The results indicated a strong relationship between student achievement and ALT-PE(M). Keller also reported that student achievement plateaus during a lesson after a certain amount of accumulated ALT-PE(M).

Two studies compared the ALT-PE of high-burnout (HB) and low-burnout (LB) teachers (Mancini, Wuest, Clark, & Ridosh, 1982; Mancini, Wuest, Clark, & Vantine, 1983). Mancini et al. (1982) observed 30 physical education

teachers who were either HB or LB. The results showed that students in the LB teachers' classes recorded more ALT-PE. Mancini et al. (1983) examined the effects of instruction and supervision in CAFIAS on the ALT-PE of HB teachers' students. Results of this study indicated that systematic supervisory feedback can change teachers' and students' behaviors and can also have a positive effect on ALT-PE accrued by students of HB teachers.

Various studies have compared ALT-PE accrued by students of different abilities. Shute et al. (1982) reported that low-, medium-, and high-skilled elementary students spent similar amounts of time in Content-PE activities, approximately 80%. However, differences in ALT-PE(M) were found between skill groups, with high-skilled students accruing 16%, medium-skilled students 11%, and low-skilled students 13%. Only very small differences between skill groups were reported in the other categories of ALT-PE in this study.

Smith (1983) compared the ALT-PE of high- and low-skilled students in the basketball classes of a male and a female physical education teacher. Results showed that both the female and the male teachers' high-skilled students were appropriately motor engaged and accrued more ALT-PE than the low-skilled students. Further results indicated the high-skilled students were more successful during motor activity than their female and male low-skilled counterparts.

A study that compared the ALT-PE of high- and low-achievers in gymnastics and volleyball classes was conducted by Pieron (1982). From the results of this study, Pieron concluded that high-achievers had more opportunities to learn than lower-achievers due to higher amounts of the time-on-task and success rate variables. Pieron reported that while many teachers' behaviors were similar, teachers tended to provide more frequent feedback and encouragement to the low-achievers. However, the difference in the teachers' behaviors was not sufficient enough to equalize the difference in ALT-PE experienced by the high- and low-achievers.

Ryan (1983) compared the ALT-PE of high-, average-, and low-skilled elementary students of a male physical educator. Additionally, using DAC, he compared the interactions of the teacher with his high-, average-, and low-skilled students. The results revealed: (a) the high-skilled students spent more time in motor activity and accrued more ALT-PE than the average- and low-skilled students; (b) the low- and average-skilled student spent more time inactive and off-task than the high-skilled students; (c) high-skilled students received more praise, acceptance, and information; and (d) average- and low-skilled students received more directions and criticism than high-skilled students.

Rate (1981) was the first investigator to use the ALT-PE instrument to examine the interscholastic setting. Rate conducted a multifaceted study that compared the

following: (a) ALT-PE in secondary school athletic practice sessions, (b) differences in ALT-PE between physical education and athletic settings in the same area, (c) differences in ALT-PE of secondary interscholastic teams, and (d) the behavior pattern of coaches in athletic practices. Five sports in various settings were represented: baseball, basketball, gymnastics, tennis, and wrestling. Rate reported the following results: (a) over 90% of practice time was spent in Content-PE activity; (b) nearly 75% of the Content-PE activity was skill practice or scrimmage; (c) the athletes were engaged for approximately 60% of all Content-PE time; (d) the average amount of ALT-PE across all practice sessions was 49.3%; (e) significant differences in ALT-PE and ALT-PE(M) were observed between wrestling and tennis practices; (f) large differences in ALT-PE and ALT-PE(M) were obtained between wrestling and gymnastics; and (g) coaches spent approximately equal amounts of time in instruction, silent monitoring, and management. Rate also noted large differences in ALT-PE between physical education classes and athletic settings. He attributed these differences to motivation of athletes, assistants available, management techniques of coaches, availability of equipment, and use of scrimmage techniques.

Another study also compared a physical education setting with an interscholastic setting. Sparks (1983) used ALT-PE to investigate differences between junior high volleyball classes and volleyball teams, along with their

teacher/coach. Results indicated that the volleyball classes accrued more ALT-PE than the teams did. Sparks reported that the teacher/coach gave almost three times as much feedback to the volleyball teams as compared to the classes.

Research Using ALT-PE to Examine the Pygmalion Effect in Coaching

The pygmalion theory explains the self-fulfilling prophecy in which students perform according to the expectations of their teacher (Martinek, Crowe, & Rejeski, 1982). Teachers' expectations of particular students may influence teachers' behaviors towards these students. If a teacher expects a student to perform well, then that teacher may have biased interactions with that student, which may result in greater student performance (Martinek et al., 1982). Several systematic observation instruments have been used to determine whether the pygmalion effect is evident not only in the classroom but in the gymnasium as well (Martinek et al., 1982). In particular, researchers have studied expectancy effects in the physical education setting using DAC and ALT-PE.

Martinek and Johnson (1979), Reisenweaver (1980), and Streeter (1980) used DAC to investigate the behavior patterns of teachers toward students of various skill levels. The results of these studies concurred that students labeled as high achievers/high-skilled received more encouragement, acceptance of ideas, and teacher

questioning than did students perceived as low achievers/low-skilled.

Studies using ALT-PE to examine expectancy effects in the gymnasium have reported similar results. Both Placek et al. (1982) and Shute et al. (1982) reported higher levels of ALT-PE and ALT-PE(M) were associated with students of high-skill ability. As skill ability increased, so did student ALT-PE and ALT-PE(M).

Pieron (1982) and Smith (1983), using ALT-PE, and Ryan (1983), using both DAC and ALT-PE, reported that high-skilled students were provided with more opportunities to learn. The high-skilled students also received more preferential treatment, more information to improve skills, accrued more ALT-PE, and experienced more success in the performance of motor activities as compared to their lesser skilled classmates.

Research on the expectancy effect has carried over from the physical education setting into the coaching setting. Boyes (1981), Hoffman (1981) and Ware (1985) used DAC to describe differences in coaching behavior towards athletes of different abilities. Results of these studies indicated that differences in coaches' behaviors toward different athletes did exist. The researchers found that coaches praised and accepted their high-skill athletes' efforts more, asked them more questions, and provided them with more information and demonstrations regarding skill techniques. These studies revealed that coaches interacted more and

exhibited more varied behaviors toward high-skilled athletes (Mancini & Wuest, 1987).

The ALT-PE instrument has been used recently in studies to observe coaches and their athletes of different abilities. Galli (1982) conducted a study which compared the ALT-PE of one high-skilled and one low-skilled male secondary basketball player. Results indicated that ALT-PE was 30.8% for the low-skilled player and 34.4% for the high-skilled player. Galli reported that the high-skilled player was more actively engaged in practice, more involved in motor responses in practice, and spent more time in game situations. The low-skilled player spent more time waiting to participate and in knowledge situations. Galli also reported that both athletes were involved 85% of practice time in Content-PE activities. No differences were reported in the ALT-PE(M) between the two players.

A study conducted by Thomas (1983) compared the ALT-PE of high-skilled and low-skilled female and male collegiate lacrosse players. Examination of the data revealed few differences in context level categories. However, at the learner involvement level several differences were found. Both male and female high-skilled players were motor engaged more often, accrued more ALT-PE, were engaged inappropriately less often, and spent less time waiting than their low-skilled teammates. Thomas also reported that both coaches treated high- and low-skilled athletes differently.

Shields (1984) conducted a study which compared the

ALT-PE of high- and low-skilled female intercollegiate soccer players. The results revealed little difference in the context levels of the players. However, at the learner involvement level, several differences were found. These differences included: (a) high-skilled players spent more time (56.8%) actively engaged in motor activity than the low-skilled players (51.8%), (b) high-skilled players accrued significantly more ALT-PE (43.6%) than the low-skilled players (29.7%), (c) high-skilled players were involved in motor inappropriate activities less often (11.4%) than the low-skilled players (19.2%), and (d) low-skilled players spent more time (13.4%) waiting than the high-skilled players (7.2%). Shields concluded that the coach treated his high-skilled and low-skilled athletes differently.

A study conducted by Hecklinger (1985) compared the ALT-PE of high-, average-, and low-skilled female intercollegiate basketball players at the beginning, middle, and end of the season. No major differences were found in the context levels of the three skill groups. However, regardless of the phase of the season, the following differences were found at the learner involvement level: (a) high-skilled players were motor engaged more (61.3%) than average- (54.3%) or low-skilled players (48.1%), (b) high-skilled players accrued more ALT-PE (42.1%) than average- (30.8%) or low-skilled players (24.8%), (c) high-skilled players spent less time inappropriately engaged

(15.1%) than average- (18.6%) or low-skilled players (17.9%), and (d) high-skilled players spent less time (9.7%) waiting than average- (15.3%) or low-skilled players (22.0%). Hecklinger indicated that results of this study supported the contention that, based on the skill abilities of their athletes, coaches interact with them differently.

Shaffner (1986) conducted a study which examined differences in ALT-PE of starting and non-starting football players. Shaffner reported no significant differences in the context levels of starting and non-starting athletes. Significant differences between athletes were reported at the learner involvement level. Results indicated that starting players were motor engaged more often (57.1% versus 47.4%), accrued more ALT-PE (39.6% versus 26.0%), and spent less time waiting (26.8% versus 37.4%) than the non-starting players.

Summary

Since the mid-1970s, research on coaches and their athletes through the use of systematic observation techniques has increased. Kasson (1975), Tharp and Gallimore (1976), Langsdorf (1980), and Darst et al. (1981) all used observation systems to record and analyze coaches' and athletes' behaviors.

Smith et al. (1977) and Horn (1983) utilized the CBAS to assess coaches' behavior. Crossman (1980) used the OSAOC to determine effects of intervention on the behavior of athletes.

The use of CAFIAS to examine differences in behavioral patterns of coaches was employed by Agnew (1977), Avery (1978), Barr (1978), Hirsch (1978), Kenyon (1981), Proulx (1979), Rotsko (1979), Sciera (1983), Staurowsky (1979), and Stulmaker (1981). These investigators examined various aspects of the coaching setting either through the use of CAFIAS alone or in combination with another investigative tool. The results of these studies contributed greatly to research in the coaching environment.

DAC, a CAFIAS modification, was utilized by Boyes (1981), Hoffman (1981), and Ware (1985) to investigate the behaviors of coaches on the college level. These studies examined the interaction patterns of coaches with their athletes of various skill abilities.

The concept of ALT-PE was an outgrowth from the research conducted through the BTES project in California. The BTES project developed the concept of ALT as a teaching process variable to assess student learning (Fisher et al., 1978). ALT was described as an observable measure of student learning (Fisher et al., 1978).

The ALT model was modified by Siedentop et al. (1979) so it could be used in the physical education and coaching environments. ALT-PE allows for the measure of active practice time allocated to students in a physical education class and the analysis of that practice time for the actual amount of individual engagement in task relevant material. The original system was revised by Siedentop et al. (1982)

to make it less difficult to use.

Metzler (1980a) and Godbout et al. (1983) provided data on ALT-PE experienced by both elementary and secondary students engaged in various activities. Aufderheide et al. (1980), Placek et al. (1982), and Shute et al. (1982) examined ALT-PE in various types of elementary settings. McKenzie (1980) investigated ALT-PE accrued by young children in an activity group outside of the formal physical education setting.

Descriptive studies of ALT-PE accrued by college level students have been conducted by Metzler (1981a) and McKenzie et al. (1983). Metzler reported higher amounts of ALT-PE by college students than elementary and secondary students as reported in his earlier study (Metzler, 1980a). McKenzie et al. reported that different instructional strategies were associated with different ALT-PE levels.

Beamer (1983), Birdwell (1980), Metzler (1981), Whaley (1980), and Wurzer (1982) utilized the ALT-PE instrument to examine the effects of various intervention strategies on teachers' behaviors. In general, the use of intervention strategies resulted in increased student ALT-PE. Grecic (1983), Griffin (1986), and Paese (1982) used ALT-PE to investigate the effects of various forms of feedback as a means of intervention on teachers' behaviors. Paese used written and verbal forms of feedback, Grecic used instruction in CAFIAS, and Griffin used instruction in ALT-PE. Results of these studies showed that the use of

feedback led to increases in ALT-PE.

The use of various instructional strategies and the effects on student ALT-PE was examined by Young (1981) and Keller (1983). Studies conducted by Mancini et al. (1982) and Mancini et al. (1983) compared the ALT-PE of classes taught by teachers experiencing various levels of burnout.

Several ALT-PE studies have compared differences in ALT-PE of students of different skill abilities. Pieron (1982), Ryan (1983), Shute et al. (1982), and Smith (1983) examined differences between high-, average-, and low-skilled students. High-skilled students typically accrued more ALT-PE than their low-skilled classmates.

The first study to examine ALT-PE in the coaching setting was conducted by Rate (1981). Rate made several comparisons of ALT-PE between teams, physical education versus athletics, and coaching behaviors. Sparks (1983) used ALT-PE to examine differences between junior high physical education classes and junior high athletic teams.

Recent research using systematic observation instruments has indicated that the pygmalion effect is evident in the physical education classroom. Martinek and Johnson (1979), Reisenweaver (1980), and Streeter (1980) using DAC found high-skilled students received preferential treatment from their teachers. Pieron (1982), Placek et al. (1982), Ryan (1983), Shute et al. (1982), and Smith (1983) have used the ALT-PE instrument to examine expectancy effects in physical education. These studies reported

high-skilled students accrued more ALT-PE than their low-skilled peers.

The effects of coaches' expectancies on athletes have recently been examined using systematic observation. Boyes (1981), Hoffman (1981), and Ware (1981) used DAC to examine differences in coaching behaviors toward their athletes of different abilities. On the whole, these studies reported preferential treatment by coaches of their high-skilled athletes. Several studies have been conducted using the ALT-PE instrument to observe coaches and their behaviors toward their athletes. Galli (1982), Hecklinger (1985), Shaffner (1986), Shields (1984), and Thomas (1983) all found the high-skilled athletes were more successful and effective in performing motor skills and accrued more ALT-PE than the low-skilled athletes.

Chapter 3

METHODS AND PROCEDURES

This chapter describes the methods and procedures used in this study. Included in this chapter are the selection of subjects, testing instrument, intraobserver agreement, procedure, method of data collection, scoring of data, treatment of data, and a summary.

Selection of Subjects

The subjects in this study were 12 female intercollegiate volleyball players at a central New York, NCAA Division III college. The coach, a female, gave the investigator permission to videotape the team's practice sessions (Appendix A). Each athlete's permission to participate in this investigation was obtained by the use of an informed consent form (Appendix B). The coach ranked her players from high to low according to overall playing ability. The top 4 ranked players were considered high-skilled, the middle 4 players average-skilled, and the remaining 4 players low-skilled.

Testing Instrument

The revised ALT-PE observation system (Siedentop, Tousignant, & Parker, 1982) was used to code the videotapes (Appendix C). The ALT-PE instrument uses a group-focused context decision and an individually-focused learner decision format. There are three major subdivisions at the context level--general content, subject matter knowledge, and subject matter motor. There are two major subdivisions

at the learner involvement level--not motor engaged and motor engaged. The context level subdivisions contain 13 categories that describe the class/practice environment. The learner involvement level contains eight categories that describe individual student/athlete behavior. The recording technique used for this study was a 6-s observe, 6-s record format.

Intraobserver Agreement

The scored-interval agreement method (Hawkins & Dotson, 1975) was used to assess intraobserver agreement (IOA) for this investigation. Four randomly selected videotapes were coded by Dr. Victor H. Mancini, an expert in descriptive-analytic techniques, during two independent coding sessions. IOA was calculated on an interval-by-interval basis and was computed by dividing the number of intervals on which there was agreement by the number of agreements plus disagreements and multiplying the result by 100 (Herson & Barlow, 1976). The formula is given below:

$$\frac{\text{Agreements}}{\text{Agreements + Disagreements}} \times 100 = \% \text{ of agreement or IOA.}$$

Procedure

Each player in this investigation was videotaped with her knowledge and consent during 18 practice sessions. The coach wore a wireless microphone which allowed her to move freely during each practice.

At the end of the season the coach ranked her players

on a continuum from high to low according to overall playing ability. For this study the top 4 ranked players were considered high-skilled, the middle 4 players average-skilled, and the remaining 4 players low-skilled.

The videotapes were coded using the ALT-PE instrument by an expert coder, Dr. Victor H. Mancini. During the coding of each practice session, three target players were selected to represent each group: high-, average-, and low-skilled players. The target players within each group were observed for an entire practice session on an alternating interval basis, using a 6-s observe and 6-s record coding format. A programmed cassette was used to provide verbal cues to observe and record.

Method of Data Collection

Data for final analysis were obtained from the coding of the 18 videotapes of the team's practice sessions. The videotapes were coded by Dr. Victor H. Mancini using the ALT-PE system.

Scoring of Data

The data were scored manually, and the percentages and ratios for the 21 variables identified by ALT-PE were calculated.

Treatment of Data

The mean percentages of each ALT-PE category were calculated. Visual comparisons of the data were made to determine whether differences occurred between the three skill groups.

Summary

The subjects in this investigation were 12 female intercollegiate volleyball players from a central New York college. The players were ranked as high-, average-, and low-skilled according to their playing ability by the coach. Eighteen practice sessions were videotaped during the same season.

Data for analysis were obtained from the coding of each videotape by Dr. Victor H. Mancini using the revised ALT-PE instrument. During the coding of each practice session, three players were randomly selected to represent each group of athletes: high-, average-, and low-skilled players. The data were scored manually, and the percentages and ratios for the 21 ALT-PE variables were calculated. Visual comparisons of descriptive statistics were used to determine differences between high-, average-, and low-skilled players.

Chapter 4

ANALYSIS OF DATA

The results obtained from the comparison of the academic learning time-physical education (ALT-PE) of high-, average-, and low-skilled female intercollegiate volleyball players are presented in this chapter. The revised ALT-PE system (Siedentop, Tousignant, & Parker, 1982) was used to describe the context levels and learner involvement levels of the players. This chapter is divided into the following sections: (a) intraobserver agreement, (b) analysis of the data, and (c) summary.

Intraobserver Agreement

Intraobserver agreement (IOA) scores were computed using the scored-interval method (Hawkins & Dotson, 1975) on an interval-by-interval basis. Four randomly selected videotapes were coded during two independent sittings by Dr. Victor H. Mancini, an expert in descriptive-analytic techniques. IOA scores were calculated for each ALT-PE category, and ranged from 91.4% to 100%, which were sufficient to indicate the coder was reliable.

Analysis of Data

Percentages were calculated manually for all ALT-PE categories for high-, average-, and low-skilled female intercollegiate volleyball players. These calculations were obtained from 2,548 observation intervals of the high-skilled players in practice, 2,545 observation intervals of the medium-skilled players, and 2,544

observation intervals of the low-skilled players.

Visual comparison of the data in Table 1 revealed virtually no difference in the context levels of high-, average-, and low-skilled female volleyball players, but several differences were found in the learner involvement levels of these three groups. The amount of time players were involved in context level activities was similar for the three groups. Regardless of their ability level, the volleyball players spent 21.6% of their time performing general, noninstructional activities. Approximately 11% of this time was devoted to transition activities. Warm-up tasks accounted for about 8% of practice time. The players spent very little time performing managerial tasks (approximately 1%) and in break or rest periods (1%) during practice.

The coach devoted about 14% of practice time providing her players with knowledge. Approximately 9% of the time was spent discussing strategy with the team. Specific volleyball techniques were described by the coach to her players about 5% of the time. Little practice time was spent by the coach relating any background information. No time was devoted to reviewing the rules of the game and discussing appropriate social behavior.

All three ability groups spent approximately 64% of practice time in subject matter motor activity. About 34% of this time was spent in skill refinement using volleyball drills. Players spent slightly more than 10% of the time in

Table 1

Percent Occurrences of ALT-PE Categories of High-, Average-, and Low-Skilled Players

ALT-PE Categories	High-Skilled	Average-Skilled	Low-Skilled
Context Level			
General Content	21.6	21.6	21.6
Transition	11.0	10.8	10.9
Management	1.3	1.4	1.4
Break	1.0	1.0	1.0
Warm-up	8.3	8.4	8.3
Subject Knowledge	14.5	14.8	14.5
Technique	4.7	4.8	4.8
Strategy	8.8	9.0	8.6
Rules	----[a]	----	----
Social Behavior	----	----	----
Background	1.0	1.0	1.0
Subject Motor	63.9	63.6	63.9
Skill Practice	34.0	33.7	33.6
Scrimmage	10.3	10.5	11.2
Game	17.3	17.1	16.8
Fitness	2.3	2.3	2.3

(table continues)

ALT-PE Categories	High-Skilled	Average-Skilled	Low-Skilled
Learner Involvement Level			
Not Motor Engaged	52.6	55.2	57.1
Interim	2.4	2.5	2.3
Waiting	14.4	15.0	18.1
Off-Task	1.7	2.5	1.6
On-Task	15.2	15.2	15.3
Cognitive	18.9	20.0	19.8
Motor Engaged	47.4	44.8	42.8
Motor Appropriate	32.7	25.8	23.4
Motor Inappropriate	11.5	15.7	16.6
Motor Supporting	3.2	3.3	2.8

Note. Due to rounding, some subcategories do not sum to exactly the same value as the categories.

[a]The dashes (----) indicate no behaviors were recorded for that category.

scrimmage situations in which various offenses and defenses were practiced, and players received feedback from their coach. About 17% of the time was spent in actual game play. There was very little time spent on fitness (about 2%) during practices.

Several differences between the players' activities were found at the learner involvement level. The low-skilled players were inactive or not motor engaged more often (57.1%) than their average-skilled (55.2%) and high-skilled (52.6%) teammates. The greatest difference occurred in the time spent waiting. The low-skilled players spent 18.1% of the time waiting, while the average-skilled players spent 15% of the time waiting, and the high-skilled players spent 14.4% of the time waiting. The players spent slightly more than 15% of the time on-task, performing transition, managerial, and warm-up tasks in the prescribed manner. The players in all three ability groups spent most of the time, when not actively engaged, listening to information from the coach (close to 20%). The players exhibited a small amount of interim (about 2.4%) and off-task (about 1.9%) behaviors.

The high-skilled players were engaged in motor activity 47.4% of the time versus 44.8% and 42.8% of the time for the average- and low-skilled players, respectively. While actively engaged in motor tasks, the high-skilled players were more successful in the performance of motor tasks (motor appropriate) and therefore accrued more ALT-PE

(32.7%) than their average-skilled (25.8%) and low-skilled (23.4%) teammates. The low-skilled (16.6%) and average-skilled (15.7%) players experienced similar amounts of time not appropriately engaged or unsuccessfully in the performing of motor skills. The high-skilled players were involved in inappropriate motor activity less often (11.5%) than their lesser skilled teammates. Motor supporting activity occurred approximately 3% of the time for all three ability groups.

Summary

The revised ALT-PE observation instrument (Siedentop et al., 1982) was used to describe the context levels and learner involvement levels of the players. To obtain IOA, four randomly selected videotapes were coded at two different settings by Dr. Victor H. Mancini, an expert in descriptive-analytic techniques. The scored-interval method (Hawkins & Dotson, 1975) was used to compute IOA. IOA scores were sufficient enough to indicate the coder was reliable.

Visual inspection of the data in Table 1 revealed little difference in the context levels of high-, average-, and low-skilled female volleyball players. Players of all abilities spent 21.6% of the time in general activities, about 14.5% of the time receiving information, and approximately 64% of the time in subject matter motor.

Several differences were found in the learner involvement levels of three groups. The low- (57.1%) and

average-skilled (55.2%) players were not motor engaged more of the time than the high-skilled (52.6%) players. The greatest difference occurred in the time spent waiting; the low-skilled players waited 18.1% of the time, average-skilled players 15% of the time, and high-skilled players 14.4% of the time.

In the motor engaged category, the high-skilled players were appropriately engaged (ALT-PE) more often (32.7%) than the average- (25.8%) and low-skilled (23.4%) players. The average- and low-skilled players were inappropriately engaged more of the time than the high-skilled players.

These results led to the rejection of the null hypothesis that stated there would be no significant differences in the amount of ALT-PE accrued by high-, average-, and low-skilled female intercollegiate volleyball players.

Chapter 5

DISCUSSION OF RESULTS

In this investigation, the academic learning time-physical education (ALT-PE) of high-, average-, and low-skilled female intercollegiate volleyball players were compared. This chapter will discuss the results of this investigation and compare the findings with those of other studies.

Visual inspection of Table 1 disclosed no significant differences in the context levels of high-, average-, and low-skilled female intercollegiate volleyball players. When one realizes that the coach kept her team intact as a single unit during practices, the results were predictable. The coach did not organize practice sessions in ways that permitted small groups within the team to perform different activities at the same time. Practice sessions were planned in such a way that all players were either engaged in activity or not engaged in the same fashion. For example, all players participated in drills of the same type together, players transitioned from one drill to another at the same time, and team strategies were discussed by the coach with the entire group.

Even though few differences were evident at the context level, major differences occurred in the players' learner involvement levels. Table 1 revealed significant differences between the ALT-PE of high-, average-, and low-skilled intercollegiate volleyball players. The

high-skilled athletes were successfully engaged in relevant tasks (ALT-PE) more often, inappropriately involved less often, and spent less time waiting than their average- and low-skilled teammates.

There are several explanations for the average- and low-skilled volleyball players' accrual of less ALT-PE during practice. Because the average- and low-skilled players spent more time waiting, they probably received fewer trials during skill-related activities. Because repetition and ball contact during a drill is important to learning and improving one's skill, the average- and low-skilled players received fewer opportunities for skill improvement. The longer period of waiting would account for their lower ALT-PE levels and motor-engaged times. The ability of the high-skilled players would also explain differences in the results. Since the high-skilled players are more skilled, then they would logically be more successful than average- or low-skilled players (as indicated by their higher ALT-PE levels). Since the coach kept the team as a single unit within the practice design, it is possible that she planned skill-related activities with the abilities of the higher-skilled athletes in mind. If this were so, then the differences in the learner involvement level are predictable.

The initial studies examining ALT-PE of students and athletes used the original ALT-PE system (Siedentop, Birdwell, & Metzler, 1979). The revised ALT-PE instrument

of Siedentop, Tousignant, and Parker (1982), utilized in many studies including this study, is similar to the original system. However, because of the changes in categories and major subdivisions, direct comparison between this study and studies using the original instrument should be made cautiously.

Metzler (1980a), in one of the original ALT-PE studies, observed the ALT-PE levels involved with different sports including volleyball. Volleyball was reported as having the highest percentage of ALT-PE, 59.4%. This investigation produced an average ALT-PE level of 27.3% for high-, average-, and low-skilled volleyball players, which is much lower than the figure reported by Metzler.

Several studies have investigated the amount of ALT-PE accrued by students of different ability levels (Placek, Silverman, Shute, Dodds, & Rife, 1982; Pieron, 1982; Ryan, 1983; Shute, Dodds, Placek, Rife, & Silverman, 1982; Smith, 1983). Placek et al. (1982) found a funnel effect in the analysis of their data. Percentages reported showed an increase for low- to medium- to high-skilled elementary students in total engagement, working at a high success rate, and in making easy psychomotor responses. The present study indicates a similar funnel effect. Shute et al. (1982) reported that high-skilled students had higher levels of ALT-PE(M) than the medium-, and low-skilled elementary students. These results are also similar to the results of the present study.

Pieron (1982) reported that high-achievers accrued significantly greater amounts of ALT-PE than did low-achievers when observed in gymnastics and volleyball classes. These results are in agreement with those of the present study. Pieron also concluded that, because the high-achievers had more opportunities to learn than the low-achievers, the gap between the two groups would widen.

Both Ryan (1983), who compared the ALT-PE of high-, average-, and low-skilled elementary students, and Smith (1983), who compared the ALT-PE of high- and low-skilled secondary students, reported similar results. Both researchers indicated that the high-skilled students spent more time engaged in motor activities, waited less, and accrued more ALT-PE than their lower-skilled classmates. These findings are similar to those found for the high- and low-skilled players in this study.

A study that compared the amount of ALT-PE accrued by students in junior high physical education volleyball classes with the amount accrued by athletes on junior high interscholastic volleyball teams was conducted by Sparks (1983). Sparks reported that the volleyball classes accrued more ALT-PE than the teams did. If one were to assume that the students in the volleyball class had, on the whole, less skill than the students on the volleyball team, then the results reported in the present study are not in agreement with the results reported by Sparks.

The ALT-PE of high school athletes involved in several

sports was observed by Rate (1981). Results reported by Rate indicated that 90% of practice time was spent in Content-PE activities. The average amount of ALT-PE across all practice sessions was 49.3%. Although the revised ALT-PE system did not have a specific category for Content-PE, the percentages for subject matter knowledge and subject matter motor obtained in this study may be combined to provide an estimate of the time spent in Content-PE activities. The female intercollegiate volleyball team members spent approximately 78% of their time in Content-PE or volleyball-related activities. This is less than the 90% reported by Rate. The average ALT-PE accrued by the athletes in this study was about 27.3%. This is lower than the 49.3% reported by Rate.

The ALT-PE instrument has been utilized by several researchers to investigate the ALT-PE of intercollegiate athletes of different ability levels. These studies have also utilized the ALT-PE instrument to assess the effects of coaches' expectations on their athletes' opportunities and success. Galli (1982) used the original ALT-PE system to compare the behaviors of a high-skilled basketball player and a low-skilled basketball player. Galli reported that both players spent about 85% of practice time in Content-PE. This is higher than the 78% recorded for the volleyball players in this study. Galli reported that the high-skilled player accrued 34.4% ALT-PE and the low-skilled player had 30.8% ALT-PE. The results of the present study are similar

to the findings of Galli.

Using the revised ALT-PE system, Thomas (1983) compared the amount of ALT-PE accrued by low- and high-skilled male and female intercollegiate lacrosse players. Thomas reported few differences in the context level. However, at the learner involvement level, he reported that high-skilled players were motor engaged more, accrued more ALT-PE, engaged inappropriately less often, and spent less time waiting than their low-skilled teammates. These results are congruent with those of the present study.

The ALT-PE of high- and low-skilled female intercollegiate soccer players was studied by Shields (1984). Results revealed high-skilled players were motor engaged more, accrued more ALT-PE, were motor inappropriate less, and spent less time waiting than the low-skilled players. At the context level little difference was reported. The results of the present study were congruent with the findings of Shields.

Hecklinger (1985) compared the ALT-PE of high-, average-, and low-skilled female intercollegiate basketball players at different phases of the season. Regardless of the phase of the season, results revealed that high-skilled players were engaged more, accrued more ALT-PE, spent less time inappropriately engaged, and spent less time waiting than their lesser-skilled teammates. Hecklinger's results are in agreement with the present study.

Shaffner's study (1986) revealed differences between

starting and non-starting intercollegiate football players. While he reported no significant differences in context levels, Shaffner reported that starting players were motor engaged more, accrued more ALT-PE, and spent less time waiting than non-starting players. The results of the present study concur with results reported by Shaffner.

Galli (1982), Hecklinger (1985), Shaffner (1986), Shields (1984), and Thomas (1983) also utilized the ALT-PE instrument to assess the effects of coaches' expectations on their athletes' opportunities and success. These researchers concluded that the coaches treated their athletes of different abilities differently. The present study concurs with the conclusions of these researchers.

The results of this investigation can also be compared to those of Boyes (1981) and Hoffman (1981), who both used the Dyadic Adaptation of CAFIAS (DAC) (Martinek & Mancini, 1979) to describe the coaching behaviors of collegiate coaches with their athletes of different skill abilities. Because of the use of different observation instruments, no direct relationships can be established between these studies and the present study. Boyes reported only minor differences in coaches' behaviors toward the athletes; therefore, few similarities existed between Boyes and the present study. However, the findings of the present study are similar to Hoffman's results in that the high-skilled players appeared to enjoy more advantageous practice conditions than their lesser-skilled teammates. In both

Hoffman's study and the present study, the coaches favored their high-skilled athletes either through their interactions with the athletes or the opportunities afforded the athletes during practice.

Ware (1985), who also used DAC, investigated the interaction behaviors of a female head volleyball coach with her high-, average-, and low-skilled intercollegiate athletes. Ware reported that the coach gave her high-skilled athletes preferential treatment by providing them with more attention, more acceptance and praise, and more opportunities to answer questions. Ware also reported that the low-skilled athletes received criticism as the most frequent interaction from the coach. The results of the present study indicate that the high-skilled athletes enjoyed a more favorable coach response through the opportunities that they were provided with in practice. Although similarities exist between Ware's study and the present study, no direct relationships can be established because of the use of different instruments.

Liskevytch (1977) offered several avenues coaches may take to assure that the potential of all athletes is realized. Liskevytch stated that coaches should pay attention to the number of meaningful contacts each player has on the ball and how much time each player is involved in active learning, a concept which parallels ALT-PE. He stated that drills should be developed to maximize the meaningful contacts for each player in the time available,

therefore, maximizing the learning experience of each player. Liskevytch stated that coaches should also reinforce the expected behaviors of athletes in practice, in order for the athlete to improve. To follow the guidelines set forth by Liskevytch, a coach must carefully plan practices, which should be part of a carefully planned total program.

Liskevytch presented a breakdown of an ideal practice session of 2 hours. The warm-up segment, which includes fitness items, is about 13% of practice time. This is slightly higher than the findings of the present study, which, when warm-up and fitness were combined, was about 10%. Liskevytch lists basic movement patterns, individual tactics and group work, which could be considered as skill segments, and when combined, equal about 30% of practice time. This is slightly lower than the findings of the present study, which found that skill development accounted for about 33.8% of practice time. Team tactics, which could be considered similar to scrimmage time in the ALT-PE system, should be about 42% of practice time as outlined by Liskevytch. The present study showed scrimmage time to be just over 10%, much lower than Liskevytch suggested. Competitive play, which could be considered game play, Liskevytch stated should be about 13% of practice time. The findings of the present study showed game play to be about 17% of practice time which is slightly higher than Liskevytch suggested. All totaled, Liskevytch stated that

there should be about 85% of practice time devoted to volleyball motor activities (basic movement patterns, individual tactics, group, team tactics, and competitive play). The results of the present study indicated a much lower percentage of practice time, almost 64%, in subject matter motor.

The findings from this study suggest that several disparities existed in the opportunities provided for the high-, average-, and low-skilled players during volleyball practices. The results of this study, therefore, suggest many practical applications for volleyball coaches to increase the ALT-PE of their players during practice sessions. The most important aspect a coach must consider is practice organization. Goals for each practice session must be established as part of long term program goals. The coach must make effective use of assistant coaches and/or managers, equipment, and court space. Any assistants involved should be made familiar with practice plans and their role in them.

Drills that coaches use should be designed or modified to fit the needs of the particular team. Any single skill or combination drill should be done on the court in relationship to how it will be used in a game. The design of the drill should take into consideration the size of the group in order to prevent any excessive waiting and to increase the number of ball contacts per player. In volleyball, especially in the learning phase of a skill, it

is important for the coach to run the drill. By tossing, throwing, or hitting the ball to players, the coach can control the tempo of the drill and also consider individual differences, and allow each athlete to experience success. A coach-controlled drill will maximize the performance of individual athletes, increase each athlete's ALT-PE, and allow for individual athlete evaluation by the coach.

Athletes should be instructed to hustle from one drill to another. The well-planned coach can instruct and motivate her players as they quickly get organized for the next drill. Athletes should be instructed that transition is not a rest period and should, in fact, be considered part of the fitness phase of practice. The results of the present study revealed that almost 11% of practice time was spent in a transition phase, and about 15% not engaged actively but on task. With additional planning, most of this time could perhaps be converted into more time for specific volleyball motor activities.

To increase the ALT-PE of average- and low-skilled players, the coach could divide the team into small groups and work on different skills with each group. This type of small group instruction could be enhanced by assigning groups various tasks for a certain amount of time. On a typical volleyball team of 12 players, four groups of three athletes could be arranged. Two of the groups could play triples, designed to improve individual skill, effort, game sense, and competitiveness. One group could work on an

individual skill such as serving and the other group could work with the coach in a coach-controlled drill. The coach could use this small group instruction to work on individual skills, position training, or lecture on strategies.

To further increase the ALT-PE of all players, a coach should try to reduce lecture time during practice time in the gym. The coach should try to lecture the athletes in a classroom before the actual on court practice begins. The results of the present study revealed that the athletes either listened to the coach discuss skills or strategies or received instructions from the coach during almost 20% of practice time. This contributed to the high percentage of time (about 55%) athletes spent not actively engaged in volleyball activities. Planning discussions and lectures during off court time would increase the athletes' ALT-PE in this type of instance.

Another approach to reduce lecture time during practice and therefore increase ALT-PE would be to avoid stopping drills, scrimmages, or game play to instruct individual players. When this happens, waiting time is increased, and active participation is decreased. A coach should remove the player from the activity and give individual instruction without stopping the entire practice.

The use of the ALT-PE instrument can assist volleyball coaches to become more aware of how they deal with athletes of different abilities and what is actually happening during their practices. With the information gained from this

study, it is evident that if volleyball coaches expect to have effective practices, then they must carefully organize and plan daily practices that fit into a carefully planned program.

Summary

Virtually no differences were found in the context levels of high-, average-, and low-skilled female intercollegiate volleyball players. This may be attributed to the coaching method of the female volleyball coach. Several differences between high-, average-, and low-skilled volleyball players existed at the learner involvement level (Table 1). These findings led to a rejection of the null hypothesis, which stated there will be no significant differences in the amount of ALT-PE accrued by high-, average-, and low-skilled female intercollegiate volleyball players.

There are several explanations for the findings in this study. The longer waiting time experienced by the low- and average-skilled players may have contributed to their lower levels of ALT-PE. By spending more time waiting, the low- and average-skilled players received less trials and, therefore, fewer opportunities to improve their skills. It is also quite possible that the superior ability of the high-skilled players contributed to their greater levels of ALT-PE.

The results of this study concur with the findings of other researchers (Galli, 1982; Hecklinger, 1985; Hoffman,

1981; Pieron, 1982; Placek et al., 1982; Ryan, 1983; Shaffner, 1986; Shields, 1984; Shute et al., 1982; Smith, 1983; Thomas, 1983; Ware, 1985) regarding the opportunities provided to athletes and students of different ability levels. The results of this study supported the contention that coaches tend to treat their athletes differently based on their skill abilities.

Chapter 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary

The purpose of this investigation was to observe the academic learning time-physical education (ALT-PE) of high-, average-, and low-skilled female intercollegiate volleyball players. Twelve female volleyball players and their female coach at a central New York college served as subjects. Eighteen practice sessions during the 1981 season were videotaped. Following the season, the coach ranked the players on a continuum from high to low according to overall playing ability. The top 4 players were classified as high-skilled, the middle 4 as average-skilled, and the remaining 4 as low-skilled. The 18 videotapes of the practice sessions were coded using the revised ALT-PE instrument (Siedentop, Tousignant, & Parker, 1982). During the coding of each practice session, three target players were selected to represent each group: high-, average-, and low-skilled players.

The ALT-PE data were scored manually and percentages calculated for each ALT-PE category. Visual inspection of the data revealed little difference in the context levels of high-, average-, and low-skilled female intercollegiate volleyball players. However, several differences were evident at the learner involvement level. High-skilled players were motor engaged more, accrued more ALT-PE, spent less time inappropriately engaged, and waited much less than

their average- and low-skilled teammates (see Table 1). The differences in accrued ALT-PE of high-, average-, and low-skilled players led to the rejection of the hypothesis that stated there would be no significant differences in the amount of ALT-PE accrued by high-, average-, and low-skilled female intercollegiate volleyball players. Players of different skill abilities are afforded different opportunities for skill development in practices. High-skilled players receive more positive opportunities for improvement than their lesser-skilled teammates.

Conclusions

The findings of this study led to the following conclusions concerning high-, average-, and low-skilled female intercollegiate volleyball players:

1. The high-, average-, and low-skilled volleyball players spend the same amount of time in general, noninstructional activities and receive the same amount of volleyball-related knowledge and motor activity. However, major differences are found in the involvement of the high-, average-, and low-skilled volleyball players during these activities.

2. The high-skilled volleyball players have more opportunity to actively perform volleyball skills than their average- and low-skilled teammates.

3. The high-skilled volleyball players are more successful and effective (ALT-PE) in performing volleyball skills than their average- and low-skilled teammates.

4. The high-skilled volleyball players are involved in motor inappropriate activities less often than their average- and low-skilled teammates.

5. The low-skilled volleyball players spend more time waiting for their turn to participate than their average- and high-skilled teammates.

6. The coach treated her high-, average, and low-skilled athletes differently.

Recommendations for Further Study

The following recommendations are suggested for further study:

1. Follow-up studies that would examine the effects of various intervention strategies on volleyball players' ALT-PE.

2. Follow-up studies that would examine individual expectancy by having the athlete judge her own performance on a daily basis.

3. A replication of this study using a Division I or II volleyball team and head coach.

Appendix A

INFORMED CONSENT FORM

COACH'S COPY

The purpose of this study is to compare the amount of academic learning time-physical education (ALT-PE) of high-, average-, and low-skilled intercollegiate volleyball players. ALT-PE is that portion of practice that the athlete spends successfully engaged in volleyball activity.

The entire team will be videotaped as a whole as much as possible during volleyball practices throughout the major portion of the volleyball season. You will be asked to wear a wireless microphone. The normal actions of the players and coach will not be interrupted. The videotapes will be coded using the ALT-PE instrument by an expert coder. At the end of the season, you will be asked to rank your players from low to high according to overall player ability.

It is assured that the names in this study will be kept strictly confidential. Taping is solely for the purpose of this study, and the tapes will be available to the researcher and the coach involved. If you do not have any questions, and you are willing to participate in this study, please sign your name in the space below. Thank you.

_____ _____

Signature Date

Appendix B

INFORMED CONSENT FORM

ATHLETE'S COPY

The study in which you are being asked to participate is to compare the amount of academic learning time-physical education (ALT-PE) of high-, average-, and low-skilled intercollegiate volleyball players. ALT-PE is that portion of practice that the athlete spends successfully engaged in volleyball activity.

The entire team will be videotaped as a whole as much as possible during volleyball practices throughout the major portion of the volleyball season. The coach will be asked to wear a wireless microphone. The videotapes will be coded using the ALT-PE instrument by an expert coder. At the end of the season, the coach will be asked to rank her players from high to low according to overall player ability.

It is assured that the names in this study will be kept strictly confidential. If you do not have any questions, and you are willing to participate in this study, please sign your name below. Thank you.

Signature _____ Date _____

Appendix C

THE ALT-PE CATEGORIES[1]

Context Level

General Content Categories--refers to class time when students are not intended to be involved in physical education activities.

Transition (T). Time devoted to managerial and organizational activities related to instruction such as team selection, changing equipment, moving from one space to another, changing stations, teacher explanation of an organizational arrangement, and changing activities within a lesson.

Management (M). Time devoted to class business that is unrelated to instructional activity such as taking attendance, discussing a field trip, lecturing about appropriate behavior in the gymnasium, or collecting money for the yearbook.

Break (B). Time devoted to rest and/or discussion of nonsubject matter related issues such as getting a drink of water, talking about last night's ball game, telling jokes, celebrating the birthday of a class member, or discussing the results of a student election.

Warm Up (WU). Time devoted to routine execution of physical activities whose purpose is to prepare the individual for engaging in further activity, but not

Appendix C (continued)

General Content Categories (continued)

designed to alter the state of the individual on a long term basis, such as a period of light exercise to begin a class, stretching exercises prior to a lesson, or a cooling down activity to terminate a lesson.

Subject Matter Knowledge Categories--refers to class time when the primary focus is on knowledge related to physical education content.

Technique (TN). Time devoted to transmitting information concerning the physical form (topography) of a motor skill such as listening to a lecture, watching a demonstration, or watching a film.

Strategy (ST). Time devoted to transmitting information concerning plans of action for performing either individually or as a group such as explanation of a zone defense, demonstration of an individual move, or discussion of how best to move the ball down a field.

Rules (R). Time devoted to transmitting information about regulations which govern activity related to the subject matter such as explanation of the rules of a game, demonstration of a specific rule of volleyball (time devoted to transmitting information about rules governing general student behavior in physical education are coded management).

Appendix C (continued)

Subject Matter Knowledge Categories (continued)

Social Behavior (SB). Time devoted to transmitting information about appropriate and inappropriate ways of behaving within the context of the activity such as explanation of what constitutes sportsmanship in soccer, discussion of the ethics of reporting one's own violations in a game, or explanations of proper ways to respond to officials in a game.

Background (BK). Time devoted to transmitting information about a subject matter activity such as its history, traditions, rituals, heroes, heroines, records, importance in later life, or relationship to fitness.

Subject Matter Motor Categories--refers to class time when the primary focus is on motor involvement in physical education activities.

Skill Practice (P). Time devoted to practice of skills or chains of skills outside the applied context with the primary goal of skill development, such as a circle drill in passing a volleyball, one against one practice of dribbling a basketball, exploration of movement forms, practicing the Schottische step, or practicing a particular skill on a balance beam.

Scrimmage/routine (S). Time devoted to refinement and extension of skills in an applied setting (in a setting

Appendix C (continued)

Subject Matter Motor Categories (continued)

which is like or simulates the setting in which the skill is actually used) and during which there is frequent instruction and feedback for the participants--such as, a half court five on five basketball activity, the practice of a complete free exercise routine, six against six volleyball (all with instructions, suggestions, and feedback during the scrimmage).

Game (G). Time devoted to the application of skills in a game or competitive setting when the participants perform without intervention from the instructor/coach--such as a volleyball game, a complete balance beam routine, the performance of a folk dance, or running a half-mile race.

Fitness (F). Time devoted to activities whose major purpose is to alter the physical state of the individual in terms of strength, cardiovascular endurance, or flexibility such as aerobic dance, distance running, weight lifting, or agility training (the activities should be of sufficient intensity, frequency, and duration so as to alter the state of the individual).

Appendix C (continued)

Learner Involvement Level

Not Motor Engaged Categories--refers to all involvement other than motor involvement with subject matter oriented motor activities.

Interim (I). The student is engaged in a noninstructional aspect of an ongoing activity such as retrieving balls, fixing equipment, retrieving arrows, or changing sides of a court in a tennis match.

Waiting (W). Student has completed a task and is awaiting the next instructions or opportunity to respond such as waiting in line for a turn, having arrived at an assigned space waiting for the next teacher direction, standing on a sideline waiting to get in a game, or having organized into the appropriate formation waiting for an activity to begin.

Off-task (OF). The student is either not engaged in an activity he/she should be engaged in or is engaged in activity other than the one he/she should be engaged in--behavior disruptions, misbehavior, and general off-task behavior, such as talking when a teacher is explaining a skill, misusing equipment, fooling around, fighting, disrupting a drill through inappropriate behavior.

On-task (ON). The student is appropriately engaged carrying out an assigned non-subject matter task (a

Appendix C (continued)

Not Motor Engaged Categories (continued)

management task, a transition task, a warm up task) such as moving into squads, helping to place equipment, counting off, doing warm up exercises, or moving from the gym to a playing field.

Cognitive (C). The student is appropriately involved in a cognitive task such as listening to a teacher describe a game, listening to verbal instructions about how to organize, watching a demonstration, participating in a discussion or watching a film.

Motor Engaged Categories--refers to motor involvement with subject matter oriented motor activities.

Motor appropriate (MA). The student is engaged in a subject matter motor activity in such a way as to produce a high degree of success.

Motor inappropriate (MI). The student is engaged in a subject matter oriented motor activity but the activity task is either too difficult for the individual's capabilities or the task is so easy that practicing it could not contribute to lesson goals.

Supporting (MS). The student is engaged in subject motor activity the purpose of which is to assist others learn or perform the activity such as spotting in gymnastics, feeding balls to a hitter in a tennis lesson, throwing a volleyball to a partner who is

Appendix C (continued)

Motor Engaged Categories (continued)

practicing set up passing, or clapping a rhythm for a group of students who are practicing a movement.

[1]Cited from Siedentop, Tousignant, and Parker (1982, pp. 11-15).

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